

### REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-20, 22, 24, and 25 are currently pending. Claim 23 has been canceled without prejudice; and Claims 1, 8, and 25 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0137701 to Shimizu (hereinafter “the ‘701 application”) in view of U.S. Patent No. 5,881,333 to Takahashi et al. (hereinafter “the ‘333 patent”), further in view of U.S. Patent No. 6,278,526 to Kurozasa (hereinafter “the ‘526 patent”); Claims 2, 4, 5 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘071 application, the ‘333 patent, and the ‘526 patent, further in view of U.S. Patent No. 6,278,513 to Murata et al. (hereinafter “the ‘513 patent”); Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘710 application, the ‘333 patent, and the ‘526 patent, further in view of U.S. Patent No. 7,312,898 to Feng et al. (hereinafter “the ‘898 patent”); Claims 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 application, the ‘333 patent, and the ‘526 patent, further in view of European Patent Application No. EP 0926622 to Nishij et al. (hereinafter “the ‘622 patent”); Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 application, the ‘333 patent, the ‘526 patent, and the ‘513 patent, further in view of Japanese Patent Publication No. 2000-196881 to Yoshiuki (hereinafter “the ‘881 patent”); Claims 9-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘701 application, the ‘333 patent, the ‘526 patent, the ‘513 patent and the ‘881 patent, further in view of the ‘622 patent; Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘898

patent in view of the '881 patent; Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the '898 and '881 patents, further in view of the '513 patent; Claim 22 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the '881 patent in view of U.S. Patent Application Publication No. 2003/0090742 to Fukuda et al. (hereinafter "the '742 application"); Claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the '742 application in view of U.S. Patent No. 5,548,664 to Knowlton (hereinafter "the '664 patent"); and Claims 24 and 25 were rejected based on the rejections of Claims 1, 19, 22, and 23.<sup>1</sup>

Amended Claim 1 is directed to an image reproduction apparatus including an image copying function for reproducing input image data including image data obtained by reading a document, and for outputting the reproduced image data, the image reproduction apparatus comprising: (1) extension control means to which a controller board is connectable to add a plurality of optional units to realize a plurality of extension functions, the extension control means allowing operation control in the plurality of extension functions to be performed in a same manner as in the image copying function, and allowing image data to be input/output in the extension functions in a same format as in the image copying function, the controller board including a system controller and an arbiter that arbitrates use of resources shared by the plurality of extension functions; (2) image quality retaining means for retaining a quality of an image reproduced via the extension control means at a level similar to that of an image produced by the image copying function; (3) operation control means for controlling operation of the image reproduction apparatus in a similar manner, regardless of whether the operation is associated with the image copying function or the plurality of extension functions provided by the extension control means; (4) resource sharing means for allowing a

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<sup>1</sup> In this regard, it is unclear to Applicant what the grounds of rejection are for Claim 24, since the Office Action states that "the limitations of Claim 24 are corrected by limitation of Claims 19, 22 and 23 above." See page 29 of the Office Action. However, Applicant notes that Claims 19, 22, and 23 are each rejected on different grounds. Further, since Claim 25 depends from one of Claims 19-24, it is unclear why Claim 25 is being rejected based on Claim 1.

resource used in the image copying function to also be used by the extension control means in inputting and/or outputting image data; (5) image input means for reading an image of the document and outputting image data of the document image; and (6) image input/output control means for controlling inputting/outputting of image data depending on an output characteristic of image data output from the image input means such that the image input means inputs/outputs image data in the same form. The changes to Claim 1 are supported by the originally filed specification and do not add new matter.<sup>2</sup>

Applicant respectfully submits that the rejection to Claim 1 is rendered moot by the present amendment to that claim.

Regarding the rejection of Claim 1 under 35 U.S.C. § 103(a), the Office Action asserts that the '701 application discloses everything in Claim 1 with exception of the controller board including a system controller and a arbiter that arbitrates use of resources shared by the one or more extension functions, and an image reproduction apparatus including image quality retaining means for retaining a quality of an image reproduced via the extension control means, and relies on the '333 and '526 patents to remedy those deficiencies.

The '701 application is directed to an image processing apparatus that includes a main controller 33, an I/O controller 51, and a network controller 42. As shown in Figure 3, the '701 application discloses a scanner interface 46 connected to a connector 56, as well as a printer interface 48 connected to a connector 59. In addition, the '701 application discloses an extended connector 50 that can be connected to other devices.

However, as admitted in the outstanding Office Action, the '701 application fails to disclose the image quality retaining means and the extension control means to which a controller board is connectable, the controller board including a system controller and an

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<sup>2</sup> See page 16 of the outstanding Office Action.

arbiter that arbitrates use of resources shared by the plurality of extension functions, as recited in Claim 1.

The '333 patent is directed to an image forming apparatus that can be modified to have an additional function in addition to its primary function. For example, the '333 patent discloses that the image processor 10 shown in Figure 1 can be modified to include a facsimile function. In particular, as shown in Figure 2, the '333 patent discloses that an expansion panel 24, which includes various additional keys required for the facsimile function can be added to the copier along with a network control (NCU) unit 23. Thus, the '333 patent discloses that expansion components 23 and 24 are added to a copier to allow the copier to also function as a fax machine, and that the copier can detect the attachment of the components 23 and 24.

However, Applicant respectfully submits that the '333 patent fails to disclose expansion control means to which a controller board is connectable to add a plurality of optional units to realize a plurality of extension functions, the extension control means allowing operation control in the plurality of extension functions to be performed in a same manner as in the image copying function, and allowing image data to be input/output in the extension functions in the same format as in the image copying function, the controller board including a system controller and an arbiter that arbitrates use of resources shared by the plurality of extension functions, as recited in amended Claim 1. In particular, the '333 patent does not disclose a controller board that includes a system controller and an arbiter that arbitrates use of resources shared by the plurality of extension functions. The '333 patent merely discloses that a network control unit 23 can be inserted to allow the facsimile function to be performed by the copier. The '333 patent is silent regarding an arbiter that arbitrates use of resources shared by a plurality of extension functions. In particular, Applicant respectfully submits that there is no arbitration of resources shared by a plurality of extension

functions in the '333 system. Rather, as shown in Figure 2, the '333 system merely discloses a control section 25, which is supplemented by an NCU 23, which handles the facsimile function. Even if the NCU 23 is interpreted as the claimed controller board, there is no arbiter on the network controller unit that arbitrates use of resources shared by a plurality of extension functions since the NCU 23 only handles the facsimile function.

The '526 patent is directed to an external computer that is connected to a main control unit of a copy machine via a control unit. In particular, the '526 patent discloses that the control unit reads programs from the ROM of the control unit for translating commands sent from the external computer and transmits the transmitted commands to the main control unit to perform a designated copy mode. Thus, the '526 patent discloses that the control unit itself performs data processing that cannot be performed by the main control unit so that various copy modes are available.

However, Applicant respectfully submits that the '526 patent, fails to disclose extension control means to which a controller board is connectable, wherein the controller board includes a system controller and an arbiter that arbitrates use of resources shared by the plurality of extension functions, as recited in amended Claim 1. Applicant notes the Office Action does not assert that the '526 patent discloses this limitation.

Thus, no matter how the teachings of the '701 application, the '333 patent, and the '526 patent are combined, the combination does not teach or suggest an extension control means to which a controller board is connectable, wherein the controller board includes a system controller and an arbiter that arbitrates use of resources shared by the plurality of extension functions, as recited in Claim 1. Accordingly, Applicant respectfully submits that the rejection of Claim 1 is rendered moot by the present amendment to that claim.

Regarding the rejection of dependent Claims 2-7 under 35 U.S.C. § 103(a), Applicant respectfully submits that the '513, '898, and '622 patents fails to remedy the deficiencies of

the '701 application, the '333 patent, and the '526 patent, as discussed above. Accordingly, Applicant respectfully submits that the rejections of dependent Claims 2-7 are rendered moot by the present amendment to Claim 1.

Amended Claim 8 is directed to an image reproduction apparatus including an image copying function for reproducing input image data including image data obtained by reading a document and outputting the reproduced image data, the image reproduction apparatus comprising: (1) extension control means to which a controller board is connectable to add a plurality of optional units to realize a plurality of extension functions, the extension control means allowing operation control in the plurality of extension functions to be performed in a same manner as in the image copying function and allowing image data to be input/output in the extension functions in a same format as in the image copying function, the controller board including a system controller and an arbiter that arbitrates use of resources shared by the plurality of extension functions; (2) image quality retaining means for retaining a quality of an image reproduced via the extension control means at a level similar to that of an image produced by the image copying function; (3) operation control means for controlling operation of the image reproduction apparatus in a similar manner, regardless of whether the operation is associated with the image copying function or the plurality of extension functions provided by the extension control means; (4) resource sharing means for allowing a resource used in the image copying function to also be used in inputting and/or outputting image data used by the extension control means; (5) line decimation control means for converting resolution of the image data; (6) pixel loss compensation means for compensating for a loss of pixel information caused by line decimation; (7) invalid pixel detection means for detecting an invalid pixel that causes a streak image in an image read using a sheet-through document feeder, prior to reading the image using the sheet-through document feeder; (8) streak image correction means for correcting the streak image; and (9) warning

means for warning of an occurrence of the invalid pixel. Claim 8 has been amended to recite the extension control means and the arbiter recited in Claim 1. No new matter has been added.

Applicant respectfully submits that the rejection of Claim 8 is rendered moot by the present amendment to Claim 8.

As discussed above, the combined teachings of the '701 application, the '333 patent, and the '526 patent fail to disclose at least the controller board including a system controller and an arbiter that arbitrates use of resources shared by a plurality of extension functions, as recited in Claim 8. Applicant respectfully submits that the '513 and '881 patents fail to remedy the deficiencies of the '701 application, the '333 patent, and the '526 patent with respect to this limitation. Further Applicant notes that the Office Action does not rely upon the '513 and '881 patents to disclose these limitations. In particular, the Office Action relies upon the '513 patent to disclose the line decimation control means and the pixel loss compensation means recited in Claim 8. Further, the Office Action relies upon the '881 patent to disclose the invalid pixel detection means, the streak image correction means, and the warning means recited in Claim 8.

However, Applicant respectfully submits that the combined teachings of the '701 application, the '333 patent, the '526 patent, the '513 patent, and the '881 patent fail to teach or suggest the expansion control means to which a controller board is connectable to add a plurality of optional units to realize a plurality of extension functions, and the arbiter recited in Claim 8. Accordingly, Applicant respectfully submits that the rejection of Claim 8 is rendered moot by the present amendment to that claim and that Claim 8 patentably defines over any proper combination of the cited references.

Regarding the rejection of dependent Claims 9-18 under 35 U.S.C. § 103(a), Applicant respectfully submits that the '622 patent fails to remedy deficiencies of the '701

application, the '333 patent, the '526 patent, the '513 patent, and the 881 patent, as discussed above. Accordingly, Applicant respectfully submits the rejections of dependent Claims 9-18 are rendered moot by the present amendment to Claim 8.

Claim 19 is directed to an image reproduction method of reproducing input image data such as that obtained by reading a document and outputting the reproduced image data, the method comprising, (1) controlling inputting/outputting of image data depending on an output characteristic of image data output from image input means such that the image input means outputs image data in a same form; (2) detecting an invalid pixel that causes a streak image in an image read using a sheet-through document feeder, prior to reading the image using the sheet-through document feeder; and (3) converting a data format of the image data such that outputting of the image data is performed in a same manner regardless of whether the image data is color image data or monochrome image data.

Regarding the rejection of Claim 19 under 35 U.S.C. § 103(a), the Office Action asserts that the '898 patent discloses everything in Claim 19 with the exception of detecting an invalid pixel that causes a streak image in an image read using a sheet-through document feeder, prior to reading the image using the sheet-through document feeder, and relies on the '881 patent to remedy those deficiencies.

The '898 patent is directed to an image transforming method for transforming an input image to produce an output image, including the steps of detecting first pixels occurring at edges representing detail within the input image, the edges including edges of graphics and text within the input image; detecting second pixels that are part of text within the input image; and combining the first pixels and the second pixels to produce the output image so that the output image includes the text and the edges of graphics, but excludes uniform fill and background within the graphics.



However, as admitted in the outstanding Office Action, the '898 patent fails to disclose detecting an invalid pixel that causes a streak image in an image read using a sheet-through document feeder, as recited in Claim 19.

Further, Applicant respectfully submits that the '898 patent fails to disclose the step of converting a data format of the image data such that outputting of the image data is performed in a same manner regardless of whether the image data is color image data or monochrome image data, as recited in Claim 19. In this regard, Applicant notes that the Office Action relies upon column 1, lines 6-40 in the '898 patent as disclosing this limitation. However, Applicant notes that this passage in the '898 patent discusses the background section of the invention and discloses conventional document formats, including TIFF, MTIFF, PDF, and JPEG. However, Applicant respectfully submits that this is not a disclosure of the converting step recited in Claim 19. Claim 19 positively recites **converting** a data format of the image data such that outputting of the image data is performed in a same manner regardless of whether the image data is color image data or monochrome image data. On the contrary, the background section of the '898 patent merely mentions standard, well known image file **formats**. However, the '898 patent does not disclose the converting step recited in Claim 9 by the mere disclosure of image formats.

The '881 patent is directed to an image processor that optimizes read correction with a sheet-through document feeder and a press plate. In particular, the '881 patent discloses two read modes, a first read mode using the sheet-through document feeder, and a second read mode using the press plate. In addition, the '881 patent discloses detecting a white stripe on a reference white board and detecting a black stripe by reading the background plate, and correcting these abnormalities.

However, Applicant respectfully submits that the '881 patent fails to remedy the deficiencies of the '898 patent and fails to disclose converting a data format of the image data

such that the outputting of the image data is performed in a same manner regardless of whether the image data is color data or monochrome image data, as recited in Claim 19.

Thus, no matter how the teachings of the '898 and '881 patents are combined, the combination does not teach or suggest the converting step recited in Claim 19. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and the rejection of Claim 19 should be withdrawn.

Regarding the rejection of dependent Claim 20, Applicant respectfully submits that the '513 patent fails to remedy the deficiencies of the '898 and '881 patents, as discussed above. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 20 should be withdrawn.

Applicant respectfully submits that the rejection of Claim 23 is rendered moot by the present cancelation of that claim.

Independent Claim 22 is directed to an image reproduction method comprising: (1) reading an image; (2) detecting an invalid pixel from the image read in the reading step; (3) detecting a maximum width of invalid pixels detected in the step of detecting the invalid pixel; (4) detecting a number of invalid pixels detected in the step of detecting the invalid pixel; (5) detecting allocation, on a document, of each invalid pixel detected in the step of detecting the invalid pixel; (6) predicting an occurrence of a streak image in a document image from results of detection made in the step of detecting the maximum width, the step of detecting the number of invalid pixels, and the step of detecting the location of each invalid pixel; and (7) correcting the streak image in the document image based on a result of the prediction made in the predicting step.

Regarding the rejection of Claim 22, the Office Action asserts that the '881 patent discloses everything in Claim 22 with the exception of detecting a number of invalid pixels detected in the step of detecting the invalid pixel, detecting allocation of each invalid pixel,

and correcting the streak image in the document image based on the prediction made in the predicting step, and relies on the '742 application to remedy those deficiencies.

The '881 patent is directed to an image processor that optimizes read correction with a sheet-through document feeder and a press plate. In particular, the '881 patent discloses two read modes, a first read mode using the sheet through document feeder, and a second read mode using the press plate. In addition, the '881 patent discloses detecting a white stripe on a reference white board and detecting a black stripe by reading the background plate, and correcting these abnormalities.

However, Applicant respectfully submits that the '881 patent fails to disclose the steps of detecting a maximum width of invalid pixels and detecting a number of a invalid pixels, as recited in Claim 22.

In this regard, Applicant notes that page 26 of the outstanding Office Action states that the '881 patent discloses that "invalid pixels width is known and can be amended." It is unclear what the Examiner means by "can be amended." Further, Applicant respectfully submits that the '881 patent does not actually disclose a step of detecting the maximum width of invalid pixels or detecting a number of invalid pixels, as required by Claim 22. Rather, the '881 patent merely broadly discloses detecting white stripes and black stripes, which is not a disclosure of that the maximum width and the number of invalid pixels is used to predict an occurrence of a streak image, as required by Claim 22.

The '742 application is directed to an image processing apparatus that detects a position of an abnormal pixel caused by obstruction to reflected light from a manuscript due to dust and corrects the abnormal pixel by using data of normal pixels surrounding the abnormal pixel on the basis of the result of a detection. Further, the '742 application discloses that a contour boundary of an area occupied by dust can be estimated.

However, Applicant respectfully submits that the '742 application fails to disclose the steps of detecting a maximum width of a invalid pixels and detecting a number of invalid pixels, as recited in Claim 22. Further, Applicant notes that the Office Action does not assert that the '742 application discloses a maximum width of invalid pixels. In this regard, Applicant notes that the Office Action appears to rely on the idea that prior art references could potentially teach certain limitations because they teach related limitations. However, Applicant notes that the cited references do not in fact disclose the limitations recited in the claims. In particular, Applicant notes that Claim 22 recites the step of predicting an occurrence of a streak image based on three factors: (1) the results of the detection of a maximum width, (2) the detecting of a number of invalid pixels, and (3) the detection of the location of the each invalid pixel. Thus, Claim 22 requires that a prediction be made based on the step of detecting the maximum width of invalid pixels. Neither the '742 application or the '881 patent discloses the detecting of a maximum width of invalid pixels and the prediction of an occurrence of a streak image based upon that value. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 22 should be withdrawn.

Regarding Claim 24, it is unclear to Applicant what the grounds of rejection are for Claim 24. The Office Action refers to claims 19, 22, and 23, which were rejected based on a combination of the '898, '881, and '742 patents. However, Applicant respectfully submits that none of these patents taken either singly or in proper combination, disclose detecting the total number of invalid pixels and the number of invalid pixels at successive locations in each block produced in a dividing step, as recited in Claim 24. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 24 should be withdrawn. In particular, Applicant notes that the Office Action does not provide any motivation for combining the references that were cited in the

rejections of Claims 19, 22, and 23. Further, it is unclear to Applicant what combinations of the references cited in the rejections of Claims 19, 22 and 23 are being applied. Accordingly, as stated above, Applicant respectfully submits that a *prima facie* case of obviousness has not been established.

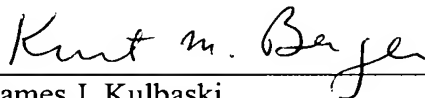
Regarding Claim 25, Applicant respectfully submits that Claim 25 is patentable at least for the reasons cited above regarding Claims 19, 22 and 24. Again, Applicant notes that the Office Action merely relies upon the rejection of Claim 1, in its rejection of Claim 25, but Claim 1 does not recite any common limitations with the limitations recited in Claim 25. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 25 should be withdrawn.

Thus, it is respectfully submitted that independent Claims 1, 8, 19, and 22-25 (and all associated dependent claims) patentably define over any proper combination of the cited references.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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